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Identifying a late medieval maritime defense network: Tower of Büyük Maden Island, Tower of Mardaliç Island and Castle of Çandarlı

1. Introduction

In this article, three late medieval fortifications are examined, which once formed a maritime defense system along the northwestern coasts of Asia Minor in present day Turkey, roughly opposite Lesbos. These buildings are: the Tower of Büyük Maden Island in Ayvalık, the Tower of Mardaliç Island in Dikili, and the Castle of Çandarlı, which are located between the Gulf of Edremit and the Gulf of Çandarlı. Although this area hosts several renowned ancient cities of Asia Minor, there is insufficient literature on late medieval historical topography studies and architectural history from an interdisciplinary perspective. The fortifications in question were previously subject to only some superficial analyses and were considered separately, without a territorial understanding.

The methodological background of this new research lies in architectural history and landscape archaeology. In this case, material characteristics were examined through field surveys and were dated through analogies with nearby examples. Meanwhile, primary sources like contemporary chronicles and textual and cartographic portolans were considered in order to examine the historical topography of the region. A preliminary viewshed experiment tried to clarify the curious positions of the towers on lower hills of their islands, in the light of a long range watchtower function that is directed towards the open sea.

According to the outcomes, it seems that the Tower of Büyük Maden Island, the Tower of Mardaliç Island and the Castle of Çandarlı were probably built under the Gattilusio rule in Lesbos (1355-1462), roughly between the 1370-1380s. In cooperation with the Turks who controlled the mainland, these fortifications formed a regional defense system against pirate raids. Architectural characteristics of the fortifications match not only with each other but also with further contemporary Gattilusio constructions, such as the castles of Mytilene and Enez.

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The curious positions of the towers on the second highest hills of their islands presumably allowed the defenders to hide in the shadows of higher hills behind them, therefore they mostly had limited protrusion on the silhouette in case of a distant approach from the open sea. Due to the long ranges of sight ensured by the towers, they were able to detect enemy ships once they appeared on the horizon, before being noticed by them. The intruders' strategic counter maneuvers while approaching were probably prevented by this means. Furthermore, the castle was built on a very strategic point before the fertile plain of Bakırçay that runs until Bergama. This particular position set the southernmost landmark for the Gattilusio responsibility to the Turks for defending the region. Meanwhile, the fortifications were perhaps also Gattilusio power symbols.

2. Literature review

The towers and the castle have previously been examined separately in the literature. They were neither linked to each other nor considered through an interdisciplinary methodology, therefore eventually remained as anonymous Genoese and/or Gattilusio buildings. For instance, the Tower of Büyük Maden Island briefly appears in some secondary sources and without any historical, topographical and architectural elaboration, it was interpreted as an individual Gattilusio watchtower for the security of its own territory (Stauber 1996, p. 225; Harissis, Harissis 2007, pp. 255-256; Psarros 2017, pp. 458, 487-488).

The Tower of Mardaliç Island was only studied during an archaeological survey in 1989. Without using any primary sources as well as making an analogy with nearby examples, basic geographical and architectural characteristics were provided, backed by a floor plan and a few low resolution photographs. This monument was interpreted as another watchtower of the Gattilusio in Lesbos, which allegedly controlled the Aegean trade network (Arel 1991, pp. 2-3, 10-12). These results were later published with a broader historical background as a literature compilation about the Genoese and Gattilusio (Arel 1995, pp. 18-23). Hence, it failed to narrow down the subject to the tower and to identify its precise function in the late medieval context.

The Castle of Çandarlı was examined by two architectural studies and multiple construction phases were detected, including its Ottoman period. After another superficial argument about an alleged similarity to "Italian" buildings in terms of general appearance, its fundamental construction was dated to the 13th-14th centuries and the fortress was interpreted in the context of the Genoese colonies of Foglia Nuova (today Yenifoça) and Foglia Vecchia (today Foça) (Müller-Wiener 1962, pp. 106-114; Holmes 2012, pp. 201-202). Yet, those works considered the building as part of the broader historical background for Genoese activities in the Aegean Sea, without any primary sources about Çandarlı. Analo-

gies for dating and a particular topographical elaboration for the exact defensive purpose before Ottomans were also missing. The attribution to the Republic of Genoa is noteworthy in both studies, instead of the local Gattilusio in Lesbos.

3. Methodology

For this study, firstly, the fortifications were architecturally surveyed on the site, for construction phases and masonry techniques. An approximate dating was proposed after analogies with each other but also with nearby examples. Masonry characteristics eventually provided an approximate context in accordance with the literature.

Secondly, topographical features were considered for the relationship between the towers and the landscape in terms of visibility and sight range, especially considering their curious positions on lower hills against the open sea. This positional correspondence and their almost identical architectural features strengthened the possibility of a defensive relationship between the towers in a regional context. Meanwhile, the strategic position of the castle was considered in the light of maritime routes and territorial coverage.

Finally, textual and cartographic primary sources in coordination with previous steps were consulted for an elaborated architectural background and historical topography, which were previously not considered. Those include a certain number of portolan charts and texts, archival registries, and contemporary chronicles. Primary sources provided detailed information about the region as well as the buildings in particular.

4. Background

The major fortification program along Asia Minor coasts after Classical Antiquity was carried out by the Byzantine Empire against Turkish onslaughts starting from the late 11th century, and the constructions lasted until the 14th century (Foss, Winfield 1986). Those castles were gradually superseded by the Ottoman works for different purposes, in accordance with the developing gunpowder technology following the mid-15th century (Holmes 2012). In this case, both the Genoese and the Gattilusio rules with their own defensive building activities fall between the Byzantine and Ottoman periods in the Aegean coasts of modern Turkey.

Genoa, as a major Italian medieval maritime republic, was an influential city-state in trade, navigation and finance between the 11th and the 19th centuries (Benvenuti 1977). The Genoese commerce in the East Mediterranean dates back to the 11th century and Genoese merchants frequented the harbors of Asia Minor and the Levant. Their first commercial privileges in Byzantine territories

came in 1155, which were just a beginning (Penna 2012). In 1261, the Byzantines allied with Genoa against the Latin Empire and offered further concessions, which included establishing colonies in Anaia, Smyrna and Adramytteion along the western Asia Minor, and Lesbos and Chios on nearby islands (Balard 1978). However, they founded further colonies; Foglia Vecchia (ancient Phokaia) and Foglia Nuova were perhaps the most renowned ones due to rich alum trade (Stringa 1982).

Meanwhile, members of the Gattilusio dynasty from Genoa had close relations with the imperial Palaiologos dynasty of the Byzantine Empire and they founded two dynastic lordships: in Lesbos (1355), by Francesco I Gattilusio; and in Ainos (1376), modern Enez, by his brother Niccolò Gattilusio. Imbros, Lemnos, Thasos and Samothrace as nearby islands were also occupied during the Gattilusio expansion. Although both lordships were independent from the Republic of Genoa, they kept political and military cooperation (Wright 2014). The somewhat overlapping Genoese and Gattilusio periods along the Aegean coasts of Asia Minor left significant architectural traces that were not thoroughly studied (Stringa 1982). Then, the growing Ottoman Empire gradually conquered their possessions in the area; the two Foglia in 1455, Ainos in 1456, Lesbos in 1462, and Chios in 1566 (Balard 1978).

5. Descriptions and state of the art

5.1. Tower of Büyük Maden Island

The tower is on a hill in Büyük Maden Island, which adjoins the northwestern end of Cunda (Alibey) Island in Ayvalık Islands, where the ancient city of Por(d)oselene existed (Talbert 2000, p. 56)¹ (fig. 1). The tower has a panoramic view over the Gulf of Edremit and Lesbos. Oriented towards the intermediate directions, the square planned structure with floor dimensions of approximately 13x13 m has been preserved at a height of roughly 10-11 m. Its massive body does not have any openings in the ground level (Özgen 2017, p. 232).

The upper level was documented with a drone survey. Traces and abundant rubble show that the tower was originally higher. This level remains nearly 6 m above the ground and a ruined opening was noticed on the southeastern façade. It was seemingly reached through a wooden drawbridge and traces of body walls with curvilinear forms give the impression that it originally had a vaulted ceiling and perhaps also a terrace, which later collapsed. A cistern continues

¹ It was documented between 2016-2020 as a part of the Adramytteion Archaeological Field Surveys directed by Asst. Prof. Dr. Hüseyin Murat Özgen (MSGSÜ Istanbul); the author is a member of the scientific board.

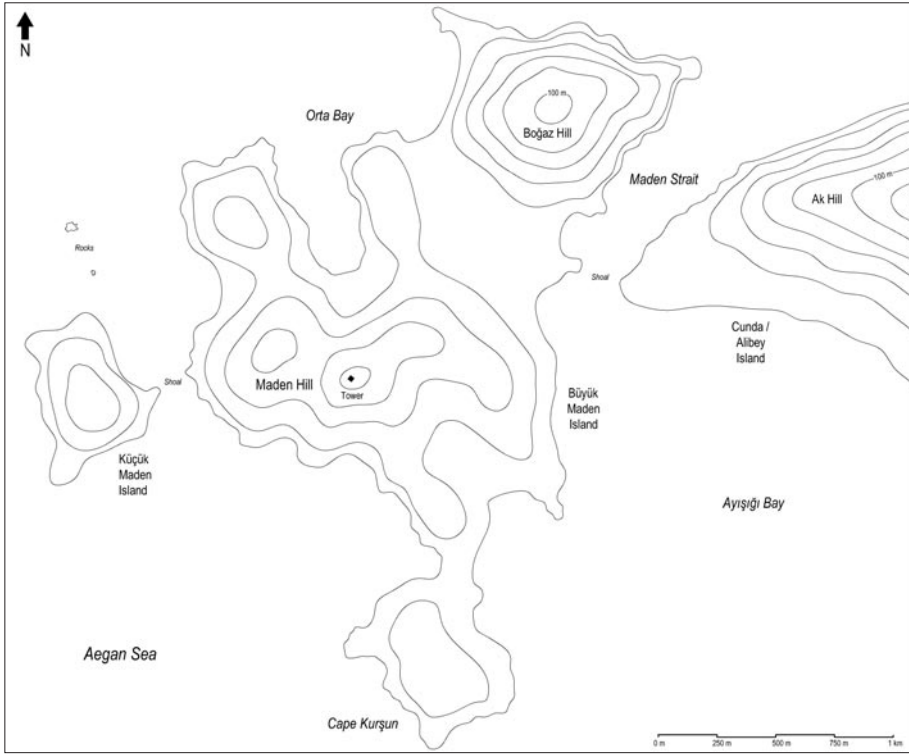


Fig. 1. Map of Büyük Maden Island.

downwards into the massive body from the center of the upper level floor. Its vault was also collapsed and rubbles filled the inner space (fig. 2).

The core of the massive body has mixed, irregular rubble and abundant lime mortar with coarse aggregates, while external façades have purple, large and hewn rectangular andesite blocks. They were used transversely and deeply with an alternating order along courses. Removed in later times and reused elsewhere, many of them are missing.

In exterior joints, the white lime mortar of the fundamental construction was finely coated with a reddish mortar with brick dust as the main aggregate. Few remains of this superficial application were seen, especially on the southeastern façade. Joints were filled partially also with flat rubble. The quality workmanship of the uniform andesite blocks and rectangular clamp holes indicate that they are spolia building materials, probably Hellenistic, and were brought from the same place. However, the tower itself is a medieval construction (Özgen 2017, p. 232). Its architecture, masonry technique and topographical positioning match with the Tower of Mardaliç Island, as discussed below.



Fig. 2. The Tower of Büyük Maden Island from the east.

The Tower of Büyük Maden Island has been the subject of few basic interpretations. It has been argued that it was built in the late medieval period, since its masonry shows similarity to the Castle of Mytilene (Stauber 1996, p. 225). According to a superficial hypothesis, with this tower Gattilusio controlled maritime trade routes between Lesbos and Asia Minor (Psarros 2017, pp. 458, 487-488). Without any primary sources, it has also been said that the tower protected Gattilusio premises on Büyük Maden Island (Harissis, Harissis 2007, pp. 255-256).

5.2. Tower of Mardaliç Island

The tower is above a steep, rocky hill on Mardaliç Island in the northwestern entrance of the Gulf of Çandarlı opposite Denizköy, Dikili. The island is alternatively known as Corci and Kızkulesi. It is commonly localized as Elaïoussa near Pitane that modern Çandarlı corresponds to this ancient city (Talbert 2000, p. 56). Oriented towards the intermediate directions, the tower has a panoramic view towards the Gulf of Çandarlı and Lesbos² (fig. 3).

Similar to the previous monument, the Tower of Mardaliç Island also has a square plan with floor dimensions of 15x15 m and a height of slightly more than

² The island is under the authorization of the Pergamon Excavations and the tower was surveyed in 2021 after the kind permission by Prof. Dr. Felix Pirson (DAI Istanbul), to whom I am grateful.

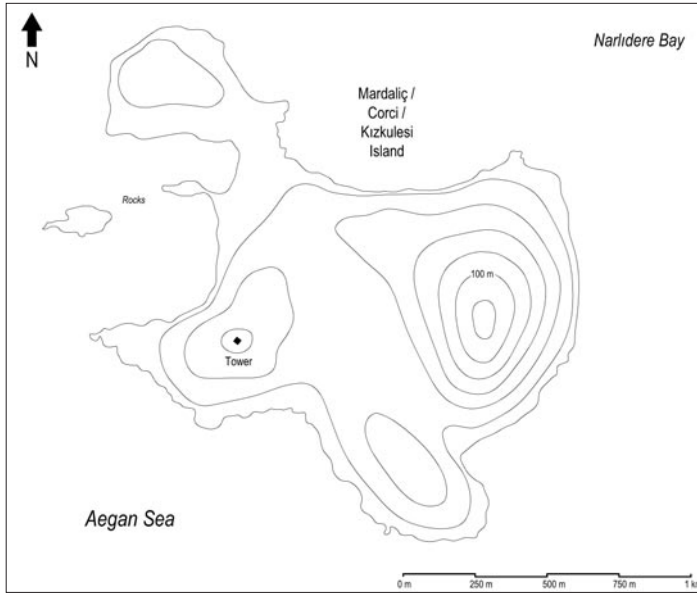


Fig. 3. Map of Mardaliç Island.

15 m. The massive body has no openings until the upper level. Its terrace was partially collapsed and the massive body includes the cistern of the tower. The main building materials are large, rectangular spolia blocks and roughly hewn, middle sized stones of various types. The inner core has rubble made of volcanic tuff and abundant white lime mortar with very thick aggregates. Like the Tower of Büyük Maden Island, exterior joints were carefully coated with a reddish mortar with brick dust aggregate (fig. 4).

Walls of the upper floor are 3.5 m thick and the entrance of this part is approximately 6.5 m above the ground and has a surrounding brick decoration. There are putlog holes right below, which supposedly supported a wooden drawbridge. Four cross vaults made of bricks once covered the upper level, carried by body walls and a central pillar. Regular beam holes along semicircular arches of those vaults probably supported a suspended wooden gallery below the ceiling. The crenellated terrace on the top is reached through narrow staircases with stone steps inside body walls (Arel 1991, pp. 2-3) (fig. 5).

After a broad historical background and architectural characteristics, the tower was defined as a late medieval construction in the Gattiluso context in Lesbos. It was interpreted as an individual watchtower that controlled trade routes in the area (Arel 1991, pp. 2-3; Arel 1995).



Fig. 4. The Tower of Mardaliç Island from the southeast.

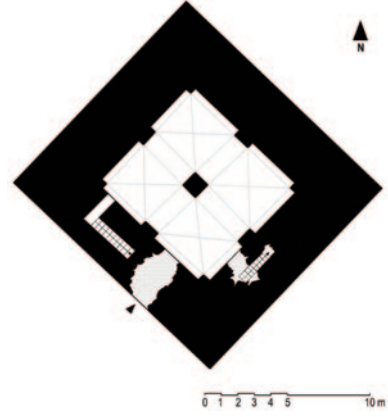


Fig. 5. Floor plan of the Tower of Mardaliç Island (after Arel 1991, p. 11, fig. 1).

5.3. Castle of Çandarlı

The castle is a trapezoidal fortification with an east-west orientation on a rocky, narrow peninsula called Cape Değirmenadası, which includes the settlement of Çandarlı (ancient Pitane) (Talbert 2000, p. 56). It oversees two harbors on the west and east, namely Karatuzlar and Çandarlı, respectively. The fortress also dominates the entire Gulf of Çandarlı towards the south, including the opposite shores of modern Yenişakran, Aliağa and Yenifoça. While its northern and northwestern sights towards the mainland are limited by the mountainous Karadağ Peninsula, the castle resembles a coastal outpost just before the mouth of Bakırçay (ancient Kaikos) 2.5 km east, as its fertile plain continues until Bergama (ancient Pergamon) 35 km northeast.

The irregular layout of the castle is approximately 55x45 m and has an area of 2300 m². The main enceinte wall around the inner courtyard has six towers with different plans. A talus surrounds the castle. It is crowned by regular battlements. Box machicolations were loosely placed on some towers and wall sections. The indented northeastern part of the enceinte with a right angle has two tall and hexagonal corner towers. Two square corner towers with different heights guard the western half of the castle. The southern façade resembles a broken line since a small bastion is located in the center and a tall, pentagonal tower constitutes the southeastern corner.

There is a small outer courtyard with a protruding form in the northeast, where main entrances of the castle are also located. This part mainly includes an elevated, wide artillery platform with four splayed embrasures in the crenellation

level. A second artillery emplacement is in the inner courtyard. There are seven vaulted embrasures and a rear platform all along the southern and partially western façades in the ground level. The northwestern tower has another vaulted embrasure towards the west, on the first floor. The façades have numerous rectangular openings as arrow slits and windows. Masonry techniques and architectural characteristics indicate that the castle has multiple construction phases.

Large, rectangular spolia ashlar with a yellowish color form the fundamental construction of the medieval castle (first phase). Hewn blocks have rough surfaces and regular courses were irregularly divided by smaller, vertical pieces. In the northwestern quarter of the fortress, lower parts of the curtain wall and the corner tower above the talus belong to this phase. Another portion can be seen on the western half of the southern façade, between the towers and again above the talus. A slightly different masonry technique (second phase) forms the next phase, which can be seen nearly everywhere on the castle, especially on towers and including box machicolations; always above the talus as well as the previous work (first phase). The almost regularly alternating order has two types of courses with different heights, as large and rectangular spolia blocks were separated by much longitudinal and smaller pieces. Probably reworked stones of this masonry have smoother surfaces than the first phase (Müller-Wiener 1962, pp. 106-114; Holmes 2012, pp. 201-202) (figs. 6-7).

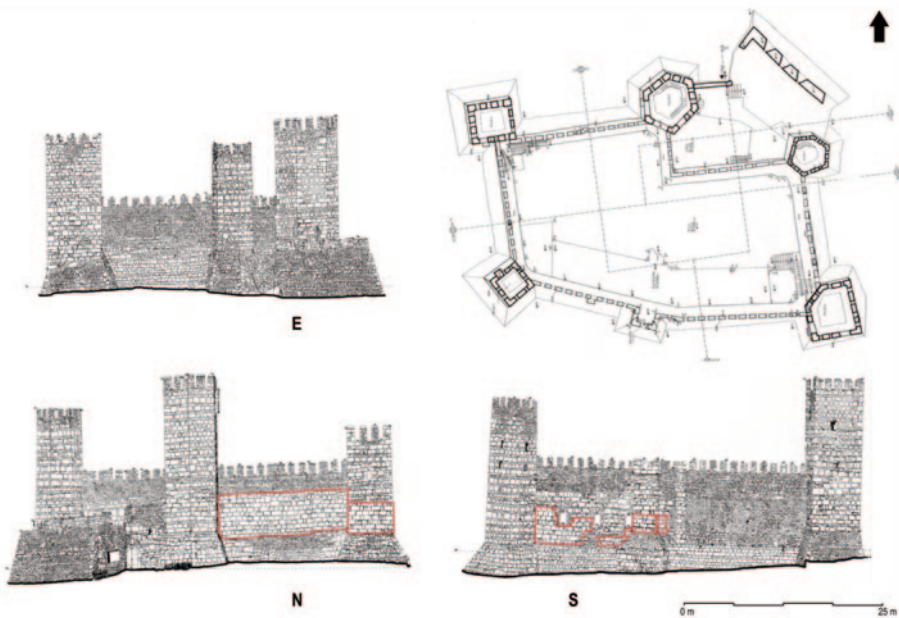


Fig. 6. Floor plan and elevation of the Çandarlı Castle. The oldest construction phase was marked in red (after Öztürker 2011, pp. 312-313, figs. 11-14).



Fig. 7. A section of the oldest construction phase around the northwestern corner of the Çandarlı Castle.

When the talus mentioned above was eventually built, it partially blockaded the first and second phases on the ground level. Afterwards, all curtain walls and towers were gradually raised and widened with a very coarse, irregular technique made of medium- to small-sized mixed rubble. The castle was turned into a cannon emplacement through embrasures and platforms. Hewn ashlar of embrasure profiles and cornerstones also belong to later phases (Müller-Wiener 1962, pp. 106-114; Holmes 2012, pp. 201-202).

Previous studies roughly dated the construction periods; on the basis of a simplistic stylistic perception, it has been argued that the first construction (phases I-II) probably dates back to the 13th-14th centuries. The overall appearance of the castle was defined as strongly reminiscing “Italian” buildings with tall and slender towers. This kind of construction under the nearby Foglia Vecchia and Foglia Nuova colonies of the Genoese was reportedly probable also from a historical perspective. Later phases were seemingly related to the gunpowder artillery following the end of the 15th century, which included the talus, embrasures, wider curtain walls and cannon platforms. After an Ottoman inscription on the main entrance, the final intervention dates back to the early 19th century (Müller-Wiener 1962, pp. 106-114; Holmes 2012, pp. 201-202).

6. Strategic positions: sight and visibility

The Tower of Büyük Maden Island has a curious position on the second highest hill of the island in the entrance of the Gulf of Edremit. Theoretically speaking, for a better sight, it could have been built on the highest hill of the island, i.e. Boğaz Hill, 1.5 km to the north, 106 m high. Even Ak Hill, 150 m high, 2 km away in the northwestern end of Cunda Island may seem a more suitable location for a coastal watchtower at first glance. However, the tower was built on the 85 m-high Maden Hill.

The tower has weak visual contact with Asia Minor coasts, because much higher hills in the east surround it, namely Boğaz Hill, Ak Hill and even Alibey Hill 6.5 km southeast, the highest hill of Cunda Island (190 m high). Thus, despite a wide angle of view from the open sea in the west, the tower makes limited protrusion from the silhouette due to those hills right behind. Especially when seen from long distances, the tower with stony façades was somewhat hidden in the shadows of those rear hills with dense vegetation. It is barely recognizable in front of this background from as near as 7 km in days with very clear weather, mainly because of the exposed core that has abundant lime mortar with a lighter color, as andesite blocks are largely missing today (fig. 8).

The Tower of Mardaliç Island resembles the previous tower by position. It was also built on the second highest hill of its island with an altitude of 70 m, instead of the highest one 900 m to the east, 125 m high. Hence, the tower is mostly invisible along Asia Minor coasts to the east and can only be seen when protruding from the silhouette. Similarly, throughout a wide angle, it remains in the shadow of the rear hill with dark vegetation, especially when seen from the open sea to

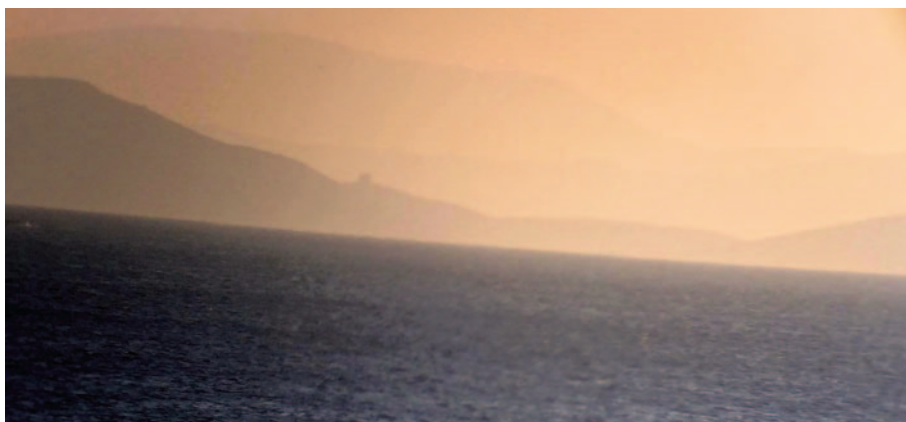


Fig. 8. Büyük Maden Island from 33 km east, where the tower is recognizable only due to the protrusion.

the west (fig. 9). Although this tower has much lighter colored building materials, its stony façades are still not recognizable from the background, when observed from a distance of even 4 km in days with clear weather. In this case, it is obvious that both towers were positioned in relation with the open sea rather than the mainland (fig. 10).

In order to interpret the seaward visibilities of both towers more accurately, quantitative data were provided for their distances to the horizon against a potential observer from the open sea. When atmospheric conditions are neglected, the formula for calculating that distance is as follows (Young 2021):

$$d \approx \sqrt{2hR}$$

Where “h” indicates the height of observer above sea level, “R” is the Earth radius and the constant 3.57 has units of km/m^{1/2} for it. Accordingly, when the distance “d” is measured in kilometers and “h” in meters, the simpler formula becomes (Young 2021):

$$d \approx 3.57\sqrt{h}$$

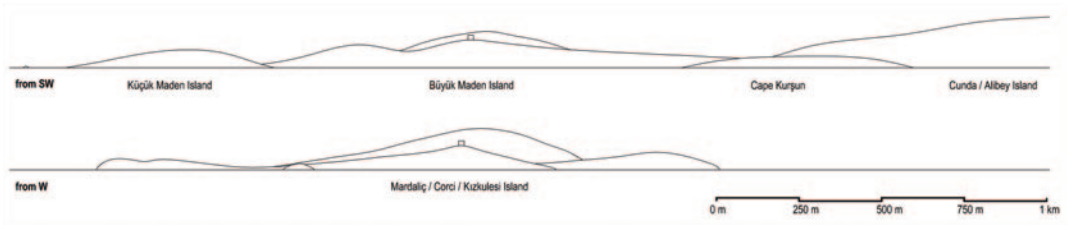


Fig. 9. Southwestern and western views of the Tower of Büyük Maden Island and the Tower of Mardaliç Island, respectively.



Fig. 10. Mardaliç Island from 4 km to the north, where the tower is recognizable only due to the protrusion.

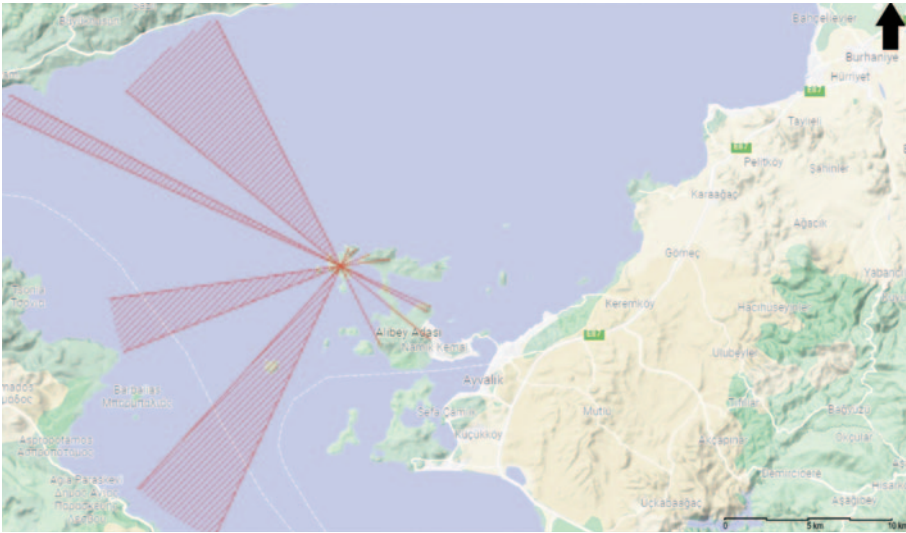


Fig. 11. Viewshed experiment for the Tower of Büyük Maden Island. While controlling the horizon, it has obstructed visibility from the hatched areas due to higher hills in the background.

For an observer above a crow's nest with an average height of 25 m on an approaching ship, the horizon would be 17.9 km away. For someone observing from an altitude of 100 m above sea level (85 m for the hill, 15 m for the tower) on the Tower of Büyük Maden Island, the horizon would be at 35.7 km. Hence, both parties would theoretically start to see each other when the distance in between was 53.6 km or less. Yet, while the ship would appear on the clear horizon towards the open sea, higher hills behind the tower would start to appear before the tower; 54.7 km for Boğaz Hill, 61.6 km for Ak Hill, and 66.4 km for Alibey Hill, therefore they would provide a dark background for the tower and obstruct its visibility from certain directions, until the viewer is getting very close. The approaching observer could recognize the tower in case of a protrusion from the silhouette (fig. 11).

Similarly, an observer on the Tower of Mardaliç, 85 m high above sea level (70 m for the hill, 15 m for the tower) would see the horizon 32.9 km away, therefore another observer on the same crow's nest approaching from the open sea to the west would start seeing the tower from 50.8 km or less. However, the highest hill of the island right behind would appear from 57.8 km and provide shadow for the tower along an even wider angle against an approaching observer on the clear horizon (fig. 12).

Meanwhile, Çandarlı Castle on a low peninsula apparently had a different military function than the watchtowers discussed above. From a landward perspective, it resembles an outpost in the entrance of the fertile Bakırçay basin

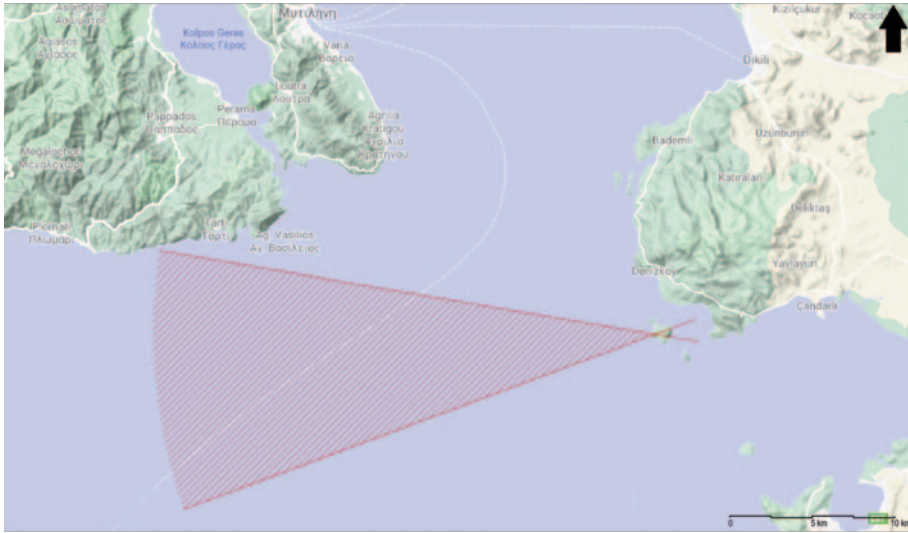


Fig. 12. Viewshed experiment for the Tower of Mardaliç Island. While controlling the horizon, it has obstructed visibility from the hatched area due to the high hill in the background.

that directly continues to Bergama. In case of an approach from the open sea, the castle dominates the whole Gulf of Çandarlı with its central position and is visible from all directions. As the building can be defined as a relatively small fortress due to its dimensions, it clearly did not include any settlement but had a strategic purpose on that particular position from a territorial perspective, which can be revealed through analogies and primary sources in the late medieval context.

7. Material characteristics and architectural comparisons

Fundamental building materials of the towers of Büyük Maden and Mardaliç islands and the Çandarlı Castle are large, rectangular hewn stones of different types. Traces indicate that they are actually reused and mostly reworked ancient materials. While yellowish and reddish sandstones are common in the Tower of Mardaliç Island and the Çandarlı Castle, the Tower of Büyük Maden Island has purple andesite blocks. Masonry techniques of the towers and the earliest phase of the castle include considerably regular courses. In order to keep order between blocks, flat rubble and even bricks were inserted at intervals horizontally and vertically. Also, rectangular blocks were placed with their short sides and long sides facing outwards with an irregular alternation.

Middle-Late Byzantine castles are distinguished by extensive brick courses, rich cloisonné and medium- to small-sized, mostly irregular rubble masonry (Foss, Winfield 1986). With their masonry techniques, the towers and the earliest phase of the castle resemble nearby Gattiluso constructions from the 14th century. Existing arguments about potential Gattiluso origins of the Tower of Büyük Maden Island were based on the similarity between the tower and some parts of the Mytilene Castle (Stauber 1996, p. 225). According to two inscriptions, the castle was rebuilt in 1373 by Francesco I Gattiluso of Lesbos. The upper castle is the most intact section in this case, as the fortress had significant extensions and alterations by the Ottomans after 1462 (Kalakallas 2014). The regular masonry on the upper part of the Mytilene

Castle with large, rectangular and purple andesite (also white marble) spolia blocks with rubble joint infilling clearly matches with the Tower of Büyük Maden Island. This technique also appears on the Çandarlı Castle (fig. 13).

Square floor plans, dimensions and masonries from large spolia of Büyük Maden and Mardaliç towers correspond to each other. They also have similar architectural details, such as elevated entrances and finely coated joints with a reddish lime mortar different than the cores. Even though the used materials are different due to local conditions, it can be argued that both watchtowers appeared during the same historical context. In this case, an almost identical tower is located in 75 m northwest of Enez Castle and was built to defend the coastline. This tower with square floor dimensions of 17x17 m and a height of nearly 15 m also has reworked large spolia, regular stone courses and an elevated entrance. An inscription indicates that it was built in 1385, therefore by Niccolò Gattiluso of Ainos, who ruled the lordship between 1376-1409. He was the brother of Francesco I Gattiluso, who ruled Lesbos between 1355-1384 (Ousterhout, Bakirtzis 2007, pp. 21-23) (fig. 14). According to other inscriptions in the castles of Chora and Palaïopoli in Samothrace and the churches of Theotokos Chrysopege and Agios Nikolaos in Enez, a certain Konstantinos, who was a master builder, worked for all four buildings under Gattiluso during the 1420s and 1430s (Androudis 2013, pp. 235-236; Ousterhout, Bakirtzis 2007, p. 34). Therefore, it is possible that Gattiluso employed same construction workers from time



Fig. 13. Upper castle section of the Mytilene Castle, dated 1373.



Fig. 14. Tower near the Enez Castle, dated 1385.

to time, which might have caused more or less coherent architectural characteristics on buildings within both lordships (fig. 15).

The towers were presumably positioned in order to inform Mytilene like rear view mirrors, as the city turned its back towards possible enemy threats from the open sea. Chios, a former Genoese colony had a similar defense system with 24 interrelated, coastal watchtowers (*vigla*). Such late medieval watchtowers belonging to Genoa, Venice, Knights Hospitaller and other West European states were common along the Mediterranean (Ierapetritis 2013).

With the development of gunpowder artillery, fortifications started to be revised against this new destructive weapon. Curvilinear forms were preferred and taluses were added in order to resist cannonballs and also to bounce them. Tall towers and walls that formerly protected inner parts against relatively slow torsion artillery became easy targets for hard-hitting cannons, therefore much shorter forms posed less threat. Castles were upgraded with embrasures and became massive cannon emplacements. All these features reflect a distinctive period in architectural history, started after 1450, which became common by the end of the 15th century (Anderson 1984, pp. 280-284; Lepage 2002, pp. 186-



Fig. 15. Masonry comparison between the Mytilene Castle (top left), the Tower of Mardalıç Island (top right), the Çandarlı Castle (bottom left) and the Tower of Büyük Maden Island (bottom right).

193; Stokstad 2005, pp. 83-85). Thus, the Çandarlı Castle clearly has two pre-gunpowder artillery architectural phases; its first two phases with tall towers to protect the inner courtyard against torsion artillery and box machicolations against infantry charges, which became useless when the external talus was attached against cannons.

8. Late medieval topography: portolans, contemporary accounts and dating

The insular toponym “izule d scā ananea” on a Genoese portolan chart called “*Carta Pisana*” from circa 1300 coincides with somewhere around the Gulf of Edremit and was named after Saint Ananias of Damascus (Sant’Anania), who

was one of the disciples of Jesus (BnF CP GE B-1118 RES). On the portolan chart of Pietro Vesconte dated 1311, it appears as “scā ananea” and more precisely around modern Ayvalık (ASF AD CN 1). Textual portolans provide more information about this place. According to the Parma-Magliabecchi portolan from the early 15th century, it appears as the southern landmark of the Gulf of Edremit:

“... from the head of Santa Maria [Cape Baba] to the head of Sant’Anania is 40 miles towards the east - southeast. There is a bay called Adramytteion [Edremit] in the north of the aforementioned head...” (Kretschmer 1909, p. 326).

The Bernardino Rizo da Novara portolan dated 1490 not only confirms the approximate position of Sant’Anania but also states that it was a convenient anchorage, which consisted of three small islands:

“... Sant’Anania is 20 miles southwest from Adramytteion. Sant’Anania is three islets that are good and safe harbors...” (Kretschmer 1909, p. 520).

In the portolan of Pîrî Reis called “*Kitâb-ı Bahriye*” (Book of Navigation) from 1525, the only anchorage around Ayvalık was defined as “*Birgoslu*” (with a tower) after “*Πύργος*” (*pyrgos* = tower) in Greek and this place corresponds to Büyük Maden Island in Ayvalık Islands (formerly Yund Islands):

“... If they arrive at the Birgoslu port in Yund Islands, it is adorned with natural beauties. It can host a hundred ships. However, there is no drinking water. If it is desired to reach the Birgoslu port in Yund Islands, the Birgoslu island is in the northwest of all of Yund Islands...” (Pîrî Reis 2013, p. 42).

Finally, in a written geographical source dated 1681, based on cartographic studies of Giuseppe Moletti (1531-1588), Sant’Anania was defined as a “*castrum*” (= castle) in Ayvalık Islands (Baudrand 1681, p. 143). Therefore, it appears that Büyük Maden Island was named after Saint Ananias of Damascus by the late medieval period and provided safe anchorage together with the adjoining Küçük Maden and Cunda islands, as a trio. The island was a local landmark with the tower.

The portolan of Grazioso Benincasa dated 1435-1445 provides detailed information about the Gulf of Çandarlı and its surroundings. This source also confirms the presence of the Tower of Mardalıç Island just before the northern entrance of the gulf and also reveals the origin of its modern name, from “*martellaccio*” (= hammer, pejorative), which essentially defined the gulf. Meanwhile, Cape Yıldırım kaya right before Yenifoça was named after its broken state as “*Ronpipatti*” (*rumpēbātis*) due to the alum mines there:

“89. If you want to know the signs of the port of Follia Nuova (Yenifoça), you will see the head of Ronpipatti on the outside when arriving ... This head of Ronpipatti of alum mines looks to Martellaccio in the north - northwest direction and they are 17 miles away from

each other. Between one end and the other, the great gulf of Martellaccio is shown. There is a tower that stands on a big rock ... The head of Ronpipatti looks to the head of Martellaccio in the north - northwest direction and they are 15 miles away from each other. This head of Martellaccio is a rock and here is the tower..." (Kretschmer 1909, p. 387).

Correspondingly, the portolan of Pietro Vesconte dated 1321 shows the toponym "Martelazo" somewhere in the northern entrance of the Gulf of Çandarlı (BL Add. MS 27376). However, in the Greek portolan of Dimitrios Tagias dated 1573, which is actually based on an older portolan with an Italian origin, a certain toponym named after Saint Theodore appears in the northern entrance of the Gulf of Çandarlı:

"... And when going from the head of Stiga in the north, you will find Agios Theodoros and there is the gulf of Kastritzi that continues for 20 miles..." (Delatte 1947, pp. 243-244).

The toponym "*Καστρίτζι*" (*Kastritzi* = small castle) was discussed below, which was seemingly a later name for the Gulf of Çandarlı due to the Çandarlı Castle. Agios Theodoros appears to be at the head of the gulf in the north. Karadağ Peninsula of Dikili appears as "Stinga" / "Stingan" on all late medieval portolans after the ancient city of Kanai in Bademli, Dikili, after "*ἡ τὴν Κάνην*" (*eis tin Kanin* = in/to Kanai) (Tomaschek 1891, p. 25). It can be argued that Mardaliç Island was called "Martellaccio" / "Agios Theodoros" by the late medieval period and had the tower as of 1435-1445. This date can also be considered for the Tower of Büyük Maden Island, as both structures architecturally match with each other. Pîrî Reis mentions Mardaliç Island once again as "*Birgoslu*" (with a tower) in 1525 (Pîrî Reis 2013, p. 43) and the Ottoman state inventory dated 1530 mentions Denizköy just opposite this island as "*Karabergoslu*" (with a black tower) (Sevim 1993, p. 392).

The Gulf of Çandarlı was initially named after the ancient city of Elaia during the Classical and Late Antiquity, located in the northeastern end of the gulf next to modern Zeytindağ (Talbert 2000, p. 56). On a series of consecutive late medieval portolan charts dated between 1200-1450, a certain change of name is noticed concerning the gulf.

Around 1375-1380, a certain small castle (Kastritzi) seemingly appeared in the area and became the focal point in the Gulf of Çandarlı, named after Elaia for centuries. While some later portolans continued the older tradition, some others preferred the new name. This small castle was most probably the Çandarlı Castle, located 9 km west of Elaia.

According to Laonikos Chalkokondyles, the Genoese were in constant conflict with Catalans and Venetians, especially over Chios and Lesbos (Chalkokondyles, *Hist.*, V, 61). George Pachymeres indicates as of 1302 that the Turks occupied most of the western Asia Minor (Zachariadou 1993, p. 227). Ac-

cording to Ibn Battuta and John VI Kantakouzenos, Yahşi Beg of Karasi controlled the region around Pergamon during the 1330-1340s (McLaughlin 2017, pp. 142, 337). He also had an armada of 200 ships based in the Gulf of Edremit by 1334 (Kunstmänn 1855, p. 155). In the mid-14th century, the Ottomans incorporated Karasi and became the sole authority in the mainland (Zachariadou 1993, p. 233). Thus, for a foreign political entity with a maritime policy (Genoese, or Gattilusio of Lesbos) from the 14th century it would have been impossible to build any fortifications without the consent of the Turks, who dominated the whole coastline between the Gulf of Edremit and the Gulf of Çandarlı at that time. Massive sizes, quality building materials and dominant positions of the towers and the castle in question give the impression that they were built in a peaceful environment and under relatively good financial conditions.

According to Doukas, if Catalan pirate ships approached from the west, it was the responsibility of the Gattilusio lord in Lesbos to notify neighboring Turkish settlements in the mainland, to whom he paid a certain annual tribute. If he failed to report the ships timely, then he would have had to compensate their damages. The territorial coverage of this obligation started from the river of Pergamon and extended until the city of Assos, called Makhramion at that time. For this purpose, the lord of Lesbos kept ready a fast ship with two rows of oars (Doukas, *Hist.*, XLIV, 4). Michael Critobulus also recalls this obligation of Lesbos, i.e. paying tribute and notifying the Turks about pirate attacks to the shores opposite Lesbos (Critobulus, *Hist.*, IV, 68).

Neither Doukas nor Critobulus provide the exact date when these obligations began. However, Laonikos Chalkokondyles states that the Gattilusio lord of Lesbos paid tribute to the Turks from the reign of Murad I (1362-1389), until the conquest of the island in 1462 by Mehmed II (Chalkokondyles, *Hist.*, X, 2). The period of 1362-1389 is important, as it overlaps with the Gattilusio works of 1373 on the Mytilene Castle and the tower dated 1385 next to the Enez Castle, which were the earliest documented Gattilusio defensive works there. "Kastritzi", the supposed Çandarlı Castle, appeared in this period too, around 1375-1380. The towers of Büyük Maden and Mardaliç islands can be considered also in this context, as their masonry characteristics correspond to these works and their overall architecture further resemble the tower in Enez. The lordships of Lesbos and Ainos apparently needed good relations with the powerful Turks, paid tribute to them, and were perchance allowed to build fortifications in return. Even though Francesco II Gattilusio of Lesbos joined the Christian anti-Ottoman league in 1388, he did not participate in the defense of Pera against the Ottomans in 1396 and the other members, namely the Genoese of Pera, the Knights Hospitaller of Rhodes, King James of Cyprus and the Mahona of Chios protested him. He also had several military cooperation with Bayezid II between 1396-1399 (Luttrell 1993, pp. 130-131; Reinert 1993, pp. 199-200).

c. 1200: " <i>Le Liber de Existencia Riverierarum</i> " (Gautier-Dalché 1995, p. 136)	"sinum Lec" [Lea (?)]
c. 1300: " <i>Carta Pisana</i> " [BnF CPL GE B-1118 (RES)]	"G. dell'lalea" ; "lalea"
1311: Pietro Vesconte (ASF AD CN 1)	"lalea"
1313: Pietro Vesconte [BnF CPL GE DD-687 (RES)]	"lalea"
1321: Pietro Vesconte (VL Vat. lat. 2972)	"lallea"
1321: Pietro Vesconte (BL Add. MS 27376)	"lalea"
1325: Angelino Dulcert (NLA YYef 2014-561)	"lalea"
1320-1350: Genoese (LOC G5672.M4P5 13— .P6)	"lalea"
1339: Angelino Dulcert [BnF CPL GE B-696 (RES)]	"G. de lalea"
1367: Domenico & Francesco Pizzigano (BPP Ms.Parm.1612)	"G. de lalea"
Late 14 th c.: Venetian [BM Ms. It. IV, 1912 (=10057)]	"Golfo de lalea"
1375: Catalan Atlas (BnF M Espagnol 30)	"G. de lalea"
1380: Guillem Soler [BnF CPL GE B-1131 (RES)]	"G. de cast'ci"
1385: Guillem Soler (ASF AD CN 3)	"G. de cast'ci"
1403: Francesco Beccario (YUL Art Storage 1980 158)	"G. de castrici"
Early 15 th c.: Venetian (BnF M Italien 1704)	"lalea"
1421: Luxoro Atlas (Desimoni, Belgrano 1872, p. 94)	"lalea"
1422: Giacomo Girolodi [BnF CPL GE C-5088 (RES)]	"lallea"
1447: Gabriel de Vallseca [BnF CPL GE C-4607 (RES)]	"G. de castiti"
1449: Gabriel de Vallseca (ASF AD CN 22)	"G. de castici"

Table 1. Toponyms in the Gulf of Çandarlı on a series of late medieval portolan charts.

On the other hand, Coriolano Cippico indicates as of 1472 that in the entrance of the fertile Aeolis region from the sea, there is a place called "*Castro*" (Castle) in the territory of Pergamon (Cippico 1570, p. 6). This statement seemingly underlines the strategic position of the Çandarlı Castle before the Kaikos basin, where the Gattilusio defensive responsibility exactly began. According to Ottoman historical sources, it was rebuilt by Çandarlı Halil Pasha the Younger, grand vizier between 1439-1453, therefore the castle bears his name (Uzunçarşılı 1988, p. 495). Pîrî Reis briefly mentions as of 1525 that it was in a very good condition (Pîrî Reis 2013, p. 43). It appears as "*Hisar-ı Yenice*" (Newish Castle) of Çandarlı in the Ottoman state inventory dated 1530, which also implies a renewal. It protected the principal harbor of the Boğazhisar Province (Sevim 1993, pp. 335, 413). In this case, the two pre-gunpowder artillery construction phases of the castle can be dated to 1375-1380 in the context of the Gattilusio of Lesbos as "Kastritzi" and then to the mid-15th century after Çandarlı Halil Pasha.

9. Conclusion

Late medieval cartographic sources indicate that Büyük Maden Island was named after Saint Ananias of Damascus, Mardaliç Island was seemingly named after Saint Theodore and “Martellaccio” (= hammer, pejorative), and the Çandarlı Castle was called “Kastritzi” (= small castle). The earliest reference for “Kastritzi” is dated 1380 and for the Tower of Mardaliç Island is 1435-1445. The same chronology can be hypothesised for the Tower of Büyük Maden Island due to architectural similarities. The Tower of Büyük Maden Island likely controlled the northern entrance into the Gulf of Edremit, while the Tower of Mardaliç Island controlled its southern entrance, and probably also the entrance into the Gulf of Çandarlı. On the other hand, with its pivotal position, the Çandarlı Castle dominated the whole gulf and the entrance to the fertile territory right behind.

With large spolia blocks, quality workmanship and regular courses, masonry characteristics of both towers and the first phase of the castle match not only with each other but also with the upper part of the Mytilene Castle built by Francesco I Gattilusio in 1373, who established a lordship in Lesbos that lasted between 1355-1462. Moreover, from an architectural point of view, both towers resemble a very similar structure dated 1385 next to the Enez Castle, where Nicolò Gattilusio established another lordship that lasted between 1376-1456. Nevertheless, those monumental fortifications must have been built in a peaceful environment, above all after the Turks' consent, who controlled the whole mainland coastline by the mid-14th century.

A series of Late Byzantine sources indicate that the Gattilusio of Lesbos paid tribute to the Turks, from some time between 1362-1389 and until 1462. They were also responsible for the security of the Turkish settlements along the mainland coastline against pirate raids right opposite Lesbos, more precisely between modern Behramkale and Çandarlı. The Gattilusio of Lesbos employed fast ships to notify them quickly, otherwise he would have had to compensate their losses. Gattilusio had further military cooperation with the Ottomans by the end of the 14th century. It could be argued that both towers provided security to Mytilene itself like rear view mirrors towards the open sea but when considered in the light of the aforementioned responsibility and the strategic position of the castle, where the defensive responsibility of Gattilusio exactly began, they were probably parts of a wider defense system between the Gulf of Edremit and the Gulf of Çandarlı. They seemingly served both the Gattilusio of Lesbos and the Turks against pirate threats from the west, and were presumably built around 1370-1380. In addition, the rather monumental appearances of all the three structures with quality workmanship far beyond essential minimum features for basic surveillance purposes, suggest that the Gattilusio of Lesbos possibly had the motivation of building regional power symbols.

The fact that both watchtowers were built on their islands' second highest hills instead of the nearby much higher ones may be seen as a curious choice as theoretically neglecting longer observation ranges. However, thanks to their position in front of higher hills from wide angles to the west, which was the direction of potential attacks, the towers do not protrude from the silhouette and their stony façades make them almost invisible from long distances, under the shadows of high rear hills with dense vegetation. Meanwhile, they still maintained dominant positions with long observation ranges and were able to detect enemy ships on the clear horizon, before any counter maneuvers against them. Nearby settlements were informed through fast ships for defensive measures. The Çandarlı Castle as a small coastal garrison called "Kastritzi" and without any settlement presumably defended the mouth of Bakırçay before Bergama for the same reason. Between Behramkale and Çandarlı, further fortifications with a probable Gattilusio origin were not observed during this research.

Abstract

This article focuses on a maritime defense network along the northwestern Aegean coasts of modern Turkey, including the Tower of Büyük Maden Island in Ayvalık, the Tower of Mardalıç Island in Dikili, and the Castle of Çandarlı. As this region lacks a detailed late medieval historical topography and architectural heritage research, the methodology considers material characteristics and analogies, primary sources such as historic portolans and chronicles, and a basic viewshed experiment. The main finding is that the three fortifications were built by the lordship of Lesbos (1355-1462) of Gattilusio, and formed a regional defense system that also served the Turks.

Keywords: medieval fortifications, Gattilusio, historical topography, landscape archaeology, architectural history.

Questo articolo indaga la rete di difese costiere lungo le coste egee nord-occidentali della moderna Turchia, comprese le torri delle isole di Büyük Maden in Ayvalık, e di Mardalıç in Dikili, e il castello di Çandarlı. Essendo assenti per questa regione studi topografici e di architettura storica, la metodologia considera caratteristiche materiali e analogie, fonti primarie come portolani e cronache, e un esperimento di visibilità. I risultati dimostrano che le tre fortificazioni furono costruite sotto Gattilusio di Lesbo (1355-1462) e facevano parte di un sistema difensivo regionale che serviva i Turchi.

Parole chiave: fortificazioni medievali, Gattilusio, topografia storica, archeologia del paesaggio, storia dell'architettura.

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